

# Decision-maker behavior to postpone investment decisions – in theory and in experimental practice

Azzurra Morreale<sup>1</sup>, Thi Thanh Tam Vu<sup>2</sup>, Luigi Mittone<sup>2</sup>, and Mikael Collan<sup>1</sup>

<sup>1</sup> School of Business and Management, Lappeenranta-Lahti University of Technology, Yliopistonkatu 34, 53851 Lappeenranta, Finland

<sup>2</sup> Department of Economics and Management, University of Trento, Via Inama 5, 38122, Trento, Italy

## EXTENDED ABSTRACT

It is well-known that real options are valuable, however, if they are not used the value is not realized. This research concentrates on studying decision-maker behavior with regards to the flexibility to postpone investment decision-making that is, we study the real option to postpone and whether and under which experimental conditions it is used by decision-makers. We are also interested in whether the decision-makers are able to price the option to postpone in a way that is in line with theory. The focus of this research is on the behavior of individual decision-makers.

Behavioral aspects with regards to real options have received only limited attention in the past and the literature on the topic is quite thin, there is however already some literature on the subject. Perception of the value of options was studied by [1], decision-making in a dynamic risky environment (sequential decision-making) was investigated in [2], and investment behavior in a game-environment was in the focus of [3]. The effect of different types of uncertainty on investment behavior was studied in [4]. The flexibility to postpone decision-making has previously been studied by [5, 6] – it is in this vein that this paper continues.

A simplistic decision-making problem is used, where the uncertainty regarding the investment decision is framed by using a “binomial” logic – an investment may have a positive or a negative outcome and the decision-maker must either make the decision to invest at  $t^0$  and take her chances with the project, or buy an option and make the decision to invest only, when the uncertainty is resolved at time  $T$ . Two different cases with different times to maturity and consequently different node-values are used in the experiment. This is a classical real-option to defer investment problem.

In the laboratory experiment, according to best-practice, the participants first perform a real-effort task in order to “earn” money that is invested in the experiment. In the second stage the participants will invest in one of two ways, as described above. The effect of the time to maturity on behavior was also studied and also simulated in real-life, as the behavior was tested while using two different real waiting-times for the uncertainty about the investment outcome to be resolved.

Eight experimental laboratory sessions were run with a total of 185 participants. The participants were paid cash-prizes based on their performance in the experiment (better outcome reached, more prize-money) to induce them to try to optimize their result in the experiment. The results were compared to theoretical expectations about the behavior of a non-biased rational decision-maker. The results show that not all decision-makers (the participants) behave rationally, but that there seems to be a group of decision-makers that categorically do not choose to use flexibility to postpone the investment decision. Furthermore, the longer time to maturity seems to have a positive effect on the tendency of the participant to choose to use the real option to postpone decision-making. This is in line with the theory based expectation.

Keywords: option to postpone, behavioral real options, experiment

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